

WHAT IS CLAIMED IS:

1. A management server connected to a plurality of servers to manage storage areas included in storage apparatuses as virtual storage areas; wherein said storage apparatuses are shared by said plurality of servers; and

said storage apparatuses includes assignment areas which are storage areas assigned to at least one of said plurality of servers;

said management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign the areas to one of said plurality of servers.

2. A management server according to Claim 1, wherein

said assignment areas of said storage apparatuses include used areas and unused areas; and

said management server includes information for identifying said used areas and said unused areas of said assignment areas;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas of said assignment areas of other servers on the basis of said identification information as

unassigned areas and assign the areas to one of said servers.

3. A management server according to Claim 1, wherein

data stored in said assignment areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority; and

said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from said server and keeps judgment result and position information of storage areas in which said data is written;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assign the areas to one of said plurality of servers.

4. A management server according to Claim 2, wherein

data stored in the used areas in said assignment areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority; and

said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from said server and keeps judgment result and position information of storage areas in which said data is written;

    said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of unused areas and at least part of areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assign the areas to one of said plurality of servers.

5.       A management server according to Claim 1, wherein

    said management server makes billing processing for each of said plurality of servers utilizing said storage apparatuses at predetermined intervals.

6.       A management server according to Claim 5, wherein

    said management server establishes different billing amounts depending on the cases where the low-priority data is stored and the high-priority data is stored.

7.       A storage apparatus system comprising:  
                a storage apparatuses; and

a management server connected to a plurality of servers and said storage apparatuses;

said management server managing storage areas of said storage apparatuses as virtual storage areas;

said storage apparatuses being shared by said plurality of servers;

said storage apparatuses including assignment areas which are storage areas assigned to at least one of said plurality of servers;

said management serve being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least one of assignment areas of other servers as unassigned area and assign the areas to one of said plurality of servers.

8. A storage apparatus system according to Claim 7, wherein

said assignment areas of said storage apparatuses include used areas and unused areas; and

said management server includes information for identifying said used areas and said unused areas of said assignment areas;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas of other servers on the basis of said identification information as unassigned areas and

assign the areas to one of said servers.

9. A storage apparatus system according to Claim 7, wherein

data stored in said assignment areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority; and

said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from said server and keeps judgment result and position information of storage areas in which said data is written;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assign the areas to one of said plurality of servers.

10. A storage apparatus system according to Claim 8, wherein

data stored in said used areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority; and

said management server judges whether data to

be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from said server and keeps judgment result and position information of storage areas in which said data is written;

    said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas and at least part of areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assign the areas to one of said plurality of servers.

11.       A storage apparatus system according to Claim 7, wherein

    said management server makes billing processing for each of said plurality of servers utilizing said storage apparatuses at predetermined intervals.

12.       A storage apparatus system according to Claim 11, wherein

    said management server establishes different billing amounts depending on the cases where low-priority data is stored and high-priority data is stored.

13.       A computer program product for a management server which manages storage areas included in storage apparatuses as virtual storage areas, wherein

said management server is connected to a plurality of servers; and

    said storage apparatuses are shared by said plurality of servers through said management server and include assignment areas which are storage areas assigned to at least one of said plurality of servers; and

    said computer program product comprising:

        a code for being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of assignment areas of other servers as unassigned areas and assign the area to one of said plurality of servers; and

        a computer readable storage medium for storing said code.

14.       A computer program product according to Claim 13, wherein

    said assignment areas of said storage apparatuses include used areas and unused areas; and

    said computer program product further comprising:

        a code for information for identifying said used areas and said unused areas of said assignment areas;

        said code for releasing at least part of assignment areas of other servers as unassigned areas including a code for being responsive to the area

assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said unused areas of other servers as unassigned areas on the basis of said identification information.

15. A computer program product according to Claim 13, wherein

data stored in said assignment areas of said storage apparatuses include high-priority data having high priority and low-priority data having low priority; and

said computer program product further comprising:

a code for judging on the basis of a write request of data from said server whether data to be written in said storage apparatuses is said high-priority data or said low-priority data; and

a code for information indicative of judgment result and position of storage areas in which said data is written;

said code for releasing at least part of assignment areas of other servers as unassigned areas including a code for being responsive to the area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of areas in which said low-priority data is stored, of the assignment areas of other servers as unassigned areas.

16. A computer program product according to Claim 14, wherein

data stored in said used areas of said storage apparatuses include high-priority data having high priority and low-priority data having low priority; and

said computer program product further comprising:

a code for judging on the basis of a write request of data from said server whether data to be written in said storage apparatuses is said high-priority data or said low-priority data; and

a code for information indicative of judgment result and position of storage areas in which said data is written;

said code for releasing at least part of unused areas of assignment areas of other servers as unassigned areas including a code for being responsive to the area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas and at least part of areas in which said low-priority data is stored, of the assignment areas of other servers as unassigned areas.

17. A computer program product according to Claim 13, further comprising:

a code for causing said management server to execute billing processing for each of said plurality

of servers utilizing said storage apparatuses at predetermined intervals.

18. A computer program product according to Claim 17, further comprising:

a code for establishing different billing amounts depending on the cases where low-priority data is stored and high-priority data is stored.